5.17.10.1 HMA: CONTRACTOR'S QUALITY CONTROL PLAN

Quality Control

The Contractor shall provide and maintain a Quality Control (QC) Plan that will assure all materials and products submitted to KDOT for acceptance will conform to the contract requirements whether manufactured or processed by the Contractor, or procured from suppliers, subcontractors, or vendors. The Contractor shall perform or have performed the inspections and tests required to substantiate product conformance to contract document requirements. The Contractor shall also perform, or have performed, all inspections and tests otherwise required by the contract. The Contractor's quality control inspections and tests shall be documented and provided to KDOT. The Contractor shall maintain adequate records of all inspections and tests. The records shall include the nature, number, and type of deficiencies found; the quantities rejected by the Contractor; and the nature of corrective action taken, as appropriate. The Contractor shall maintain standard equipment and qualified personnel as required by the Specifications to assure conformance to contract requirements. Procedures will be subject to approval by KDOT before the work is started.

The Contractor shall prepare a QC Plan detailing the type and frequency of inspection, sampling, and testing deemed necessary to measure and control the various properties of materials and construction governed by the Specifications. The QC Plan shall be submitted in writing to KDOT at the preconstruction conference. This Plan shall include the following:

Construction items covered by the Plan
Tests and Test Frequency to be performed
* Part V; Appendix B
Sampling locations and techniques
Documentation procedures, including:
* Identify the QC Laboratory to be used and it's credentials
* Identify the QC personnel and their qualifications
* Inspection and test records
* Temperature measurements
* Accuracy and Readability, calibration, or re-calibration checks performed on production or testing equipment
* Control charts

The Plan shall identify the personnel responsible for the Contractor's quality control. This should include the name of the company official who will act as liaison with KDOT personnel and the names of the Certified Technicians who will direct and conduct the inspection program. The Contractor shall provide a testing facility or laboratory.

Samples, Tests, and Referenced Cited Specifications

The Contractor shall be responsible for the quality of construction and materials incorporated into the contract. The Contractor shall perform all necessary quality control inspection, sampling, and testing. All materials will be approved for acceptance through KDOT's acceptance procedures. KDOT has the responsibility for determining the acceptability of the construction and materials incorporated therein. KDOT may use the results of the Contractor's inspection, approved quality control program. To eliminate confusion when transferring information, provide all critical information as outlined in **Table 1**.

TABLE 1 Test Report Requirements

a. Name and address of the testing laboratory
b. Identification of the report and the date issued
c. Project number and contract number
d. Description and identification of the test sample (including sublot numbers)
e. Date of receipt of the test sample
f. Date(s) of test performance
g. Identification of the standard test method used and a notation of all known deviations from the test method
h. Test results and other pertinent data required by the standard test method
i. Identification of any test results obtained from test performed by a subcontractor
j. Name and certification number of the person(s) technically responsible for the test report

Qualified Testing Laboratory

The Materials and Research Center is accredited through the AASHTO Accreditation Program (AAP). If the contractor's QC laboratory is not participating in the AAP, then the contractor shall have an AAP approved laboratory inspect the QC laboratory's equipment annually. The inspection shall include all equipment necessary to perform testing on specified types of material related to the contract; base and grading, aggregate, HMA, and concrete.

The Contractor's QC Laboratory shall be furnished and maintained with adequate ventilation, heat, light, water, sink and drainage, electrical or gas outlets or both, work tables, shelves, and supply cabinets. The laboratory shall be supplied with equipment and materials necessary to perform all tests required by the specifications and shall be maintained in such condition that the equipment will meet the applicable requirements of KDOT.

KDOT will annually inspect and document the acceptability of the sampling and testing equipment. This includes sampling and testing equipment owned by contractors, consultants, or vendors. Checks on equipment during the life of a project should be accomplished by project sampling and testing personnel as well as KDOT personnel.

Equipment Calibration and Verification

The QC Laboratory shall have all significant testing equipment calibrated or verified that is associated with tests covered by the scope of this standard which the QC Laboratory performs. Copies of all current equipment calibration records shall be maintained in a Quality Manual and stored in the laboratory. As a minimum, the equipment listed in **Table 2** shall be included if it is associated with tests performed by the QC Laboratory. Applicable equipment shall be calibrated or verified at the intervals specified in the QC Laboratory's Quality Manual (see Appendix B). The intervals specified in the Quality Manual shall be no greater than those indicated in **Table 2**. Newly acquired equipment without manufacturer's certification and equipment that has not been calibrated or verified because it has been removed from service shall be calibrated or verified before being placed in service. The QC Laboratory shall have detailed written procedures for all in-house calibration and verification activities not addressed in standards. These procedures shall indicate the equipment required to perform the calibration or verification.

Certain items in **Table 2** can be verified by the contractor's QC Certified Technician. These items are: mechanical shakers, ovens, sieves and weighted foot.

Technician Certification

KDOT requires that at all individuals be certified who perform one or more of the actual sampling testing and inspection functions for KDOT, Contractor, or private laboratories. A certification program helps to ensure qualifications of sampling and testing personnel and increases pride in the work performed.

Certified sampling and testing personnel provide added assurances that the sampling and testing will be performed correctly and that the results will be valid.

The individuals performing any sampling and testing of materials must be knowledgeable in the sampling and testing procedures that have been specified by KDOT.

Certification programs recognized by KDOT should be one or more of the following:

The American Concrete Institute or other trade association;

KSU-Salina (aggregate technician certification);

KSU-Manhattan (HMA field and design laboratory technician certification); and Reciprocity between state agency's subject to approval by the District Materials Engineer.

For additional information concerning an acceptable certification program, contact the Bureau of Materials and Research.

TABLE 2 HMA Materials Test Equipment

Equipment - Test Method	Requirements	Interval (months)
Mechanical Shakers	Check Sieving Thoroughness	12
General Purpose Balances, Scales and Masses - AASHTO M 231	Verify	12
Test Thermometers - KT-15, KT-39, KT-56, KT-58	Calibrate	12
Compression Testing Machine	Verify Load Indication	12
Ovens	Verify Temperature Settings	4
Vacuum System - KT-39	Check Pressure	12
Sieves - AASHTO M 92	Check Physical Condition	6
Nuclear Density Gauge - KT-32	Factory Calibration *	12
Weighted Foot Assembly - KT-55	Check Mass of Assembly	12
Gyratory Compactor Mold - KT-58	Verify Internal Dimensions	12
Gyratory Compactor - KT-58	Calibrate Pressure; Verify Rotation, Height and Angle	12

NOTE *: Calibration of the gauge performed to the standards of the manufacturer or better. Density must be calibrated across a series of metal blocks at various depths.

Note: Appendix A, Guide for Quality Control and Acceptance Requirements for HMA, will help to define the minimum contents necessary for an acceptable Quality Control Plan.

Appendix B, Example of a Laboratories Quality Manual, will provide examples of equipment procedures to verify that equipment is in proper condition. Also, examples of records for calibrating/verifying equipment are presented.